

Name _____

Periodic Properties Puzzle AF

The objective of this lesson is to use the periodic properties of the elements to fill the in the attached chart. The code letters do not represent certain chemical symbols, that is, C may not be carbon. The elements have not been assigned in alphabetical order, either.

Those letters are presented in families, and your task is to arrange these letters in the proper location in the periodic table. To do this, use the clues given pertaining to certain members of each family. The numbers in each square in the table are the atomic numbers of the element. The *d*-block elements have been excluded.

The best way to start is to use the clues to find in which group each family belongs, and then to arrange the elements within the family using the other clues. The following elements belong together in families:

ABC DEF GHI JKL MNO PQR STUV WXYZ

Clues:

1. The ionization energy of N is less than O, but larger than M.
2. O has been known to have a 4- charge as an ion.
3. X is larger than Y, but smaller than Z.
4. Within it's group, Q requires the least energy to lose an electron and forms the compound T₂Q.
5. Both S and T explode on contact with water, but T reacts more rapidly.
6. F and J are the largest atoms in their groups.
7. X is the smallest atom in its period.
8. Both A and U are in the same period, but A has a higher density and is less reactive than U.
9. No compounds of W are known to exist, it is also the smallest atom in its group.
10. J has five valence electrons.
11. K has a $3s^23p^3$ configuration, while H has a $3s^23p^1$ configuration.
12. Within the same period, B is larger than G but smaller than T
13. R needs to gain two electrons to completely fill the third energy level.
14. A is the smallest alkaline earth element.
15. D is the most electronegative element.

The following periodic table only shows the main group elements (*s* and *p* blocks). Note that the atomic numbers jump from 20 to 31 in the fourth period. This is because this table excludes the transition elements.

1							2
3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18
19	20	31	32	33	34	35	36